PRETREATMENT PROCESS DESCRIPTION

Approximately 1 million gallons per day (gpd) of process wastewater are pumped from the mill to the IWPS for processing. The treatment method is dissolved air floatation (DAF) for solids removal. No specific treatment for BOD5 is provided; however, BOD5 is reduced by removal of solids. In 2007 through December 11, approximately 94% of the process flow was returned to the mill following treatment by DAF for reuse in the mill. Approximately 6% of the water sent to the IWPS was eventually discharged to the sewer. The components of the IWPS are briefly described below.

Dissolved Air Flotation System (DAF)

The DAF system is the primary treatment component of the IWPS. Its function is to remove suspended solids. The DAF operates by generating small bubbles in the unit that attach to solids and cause them to float to the surface where they are skimmed off. This is achieved by withdrawing a portion of the DAF effluent, saturating the water with air under pressure, and reinjecting the water into the influent. When the air-saturated water enters the DAF at lower pressure, it is supersaturated with air and micro-bubbles will form. A polymer is also introduced into the DAF influent to promote flocculation of particles to improve removal.

Sludge Processing

Floating solids and DAF underflow are dewatered using a rotary drum thickener and a screw press to increase the solids content of the sludge to approximately 40%. The water extracted during sludge processing is recycled back into the manufacturing process. Dewatered solids are sent off site for use in the production of compost.

City Pit

The City Pit is an approximate 12,000-gallon, in-ground concrete tank where wastewater that is to be discharged to the Haverhill sewer system is collected. Excess wastewater from the DAF is discharged to the City Pit. Previously HPB operated the mill with 100% recycle of wastewater; however, build up of dissolved solids led to deposits on the paper machines and other equipment. Currently the mill operates with a targeted discharge of 30,000 to 40,000 gpd to prevent these deposits. The discharge to the City Pit is controlled by an automated valve at a daily limit set by the operator (i.e., when the total discharge for the day from the City Pit to the city sewer reaches the operator-entered set point, the valve to the City Pit is closed and all of the water is reused).

Discharge pH Monitoring

pH monitoring is conducted on the wastewater discharged to the City Pit. A side stream from the discharge to the City Pit drains into a small container where the pH probe is mounted. The container overflows into the City Pit. The pH reading is continuously monitored by the distributed control system (DCS) and the wastewater discharge valve to the City Pit is automatically closed, if the pH is out of the allowable range. pH is recorded on a chart recorder inside the Pump Building.

Effluent Sampling

Process wastewater effluent discharged by the IWPS to the City of Haverhill sewer system is sampled by an automated, refrigerated composite sampler located in the Pump Building. The sampler pulls samples from the discharge pipeline. City of Haverhill wastewater personnel are allowed access to the sampler for collection of samples to be analyzed by the City.

Discharge Pumps/Flow Meter

There are two discharge pumps connected to the City Pit, which transfer water to the City of Haverhill sewer force main. Only one pump is required to operate at a time and discharge is conducted on an on/off basis based on level set points in the City Pit. The flow rate being discharged is measured by a magnetic flow meter and flows are totalized and recorded on a chart recorder. The sanitary wastewater force main combines with process wastewater after all the measurement locations and prior to the connection to the City of Haverhill force main.